

**Karner Blue Butterfly Management On
Necedah National Wildlife Refuge
2011**



(An Annual Report Submitted to the U. S. Fish and Wildlife
Service's Green Bay Field Office)

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August 30, 2011

INTRODUCTION

This report is being submitted to the U.S. Fish and Wildlife Service's Green Bay Field Office to fulfill reporting obligation stipulated in a Biological Opinion issued by the Green Bay Field Office. This report insures that the Necedah National Wildlife Refuge is implementing the "Reasonable and Prudent Measure" outlined in the Biological Opinion.

Necedah National Wildlife Refuge has added two permanent refugia for Karner blue butterflies; now total four (4). The new refugia are known as the Goose Pool and East Sprague E Sites and contains portions of Prairie Restoration Units 13, 14, & 18 (See Figure 1). Although peer-reviewed research has demonstrated that there is no need for no-burn set-aside areas (refugia), the Refuge is incorporating four refugia as an additional conservation. Figure 1 also illustrates the location of all burn units with Karner blue butterfly populations on Necedah National Wildlife Refuge

The reported items below correspond to the "Terms and Conditions" Section (p. 24) of the Biological Opinion.

- 1) **Condition #2 - Annual Surveys** – The Refuge completed its nineteenth year of Karner blue butterfly surveys in 2011. However, due to lack of funding, Refuge-wide surveys were not conducted in 2011. As a result, some 2011 population estimates could not be made. Results for each Karner blue butterfly complex where surveys were conducted are provided in Table 1. Based on these results alone, Necedah National Wildlife Refuge is above the recovery goal (Table 3). These units total just 248.93 acres. The Refuge has an additional 3,805 acres of occupied habitat (Figure 1).

Karner blue butterfly surveys and population estimates were performed using the following methods:

- a) Pollard-Yates type surveys were conducted on each Karner blue butterfly site at least three times during the peak of second flight. At least seven day spacing between the surveys was used. Results of the three counts were summed.
 - b) "Distance" methodology was used to determine the density of Karner blue butterflies at each site.
 - c) The density was then multiplied by the size of each unit, which was determined with Geographic Information Systems (GIS) technology.
 - d) A Refuge wide population estimate for the Refuge in 2011 was 29,118 adult Karner blue butterflies.
- 2) **Units Treated in 2011** – The Refuge prescribe burned Prairie Restoration Units 3, 14, 19, 20, & 27 and Oak Savanna Restoration Units 22, 27, & 28 in 2011.

Portions of Oak Savanna Restoration Units 22 & 27 were mowed in 2011 (Figure 2). Portions of Oak Savanna Restoration Units 5, 6, 9A, 9B, 9C, 28, 30, & 33 and Prairie Restoration Units 23, & 32 were herbicide treated in 2011.

Figure 1. Karner blue butterfly occupied habitat on Necedah National Wildlife Refuge.

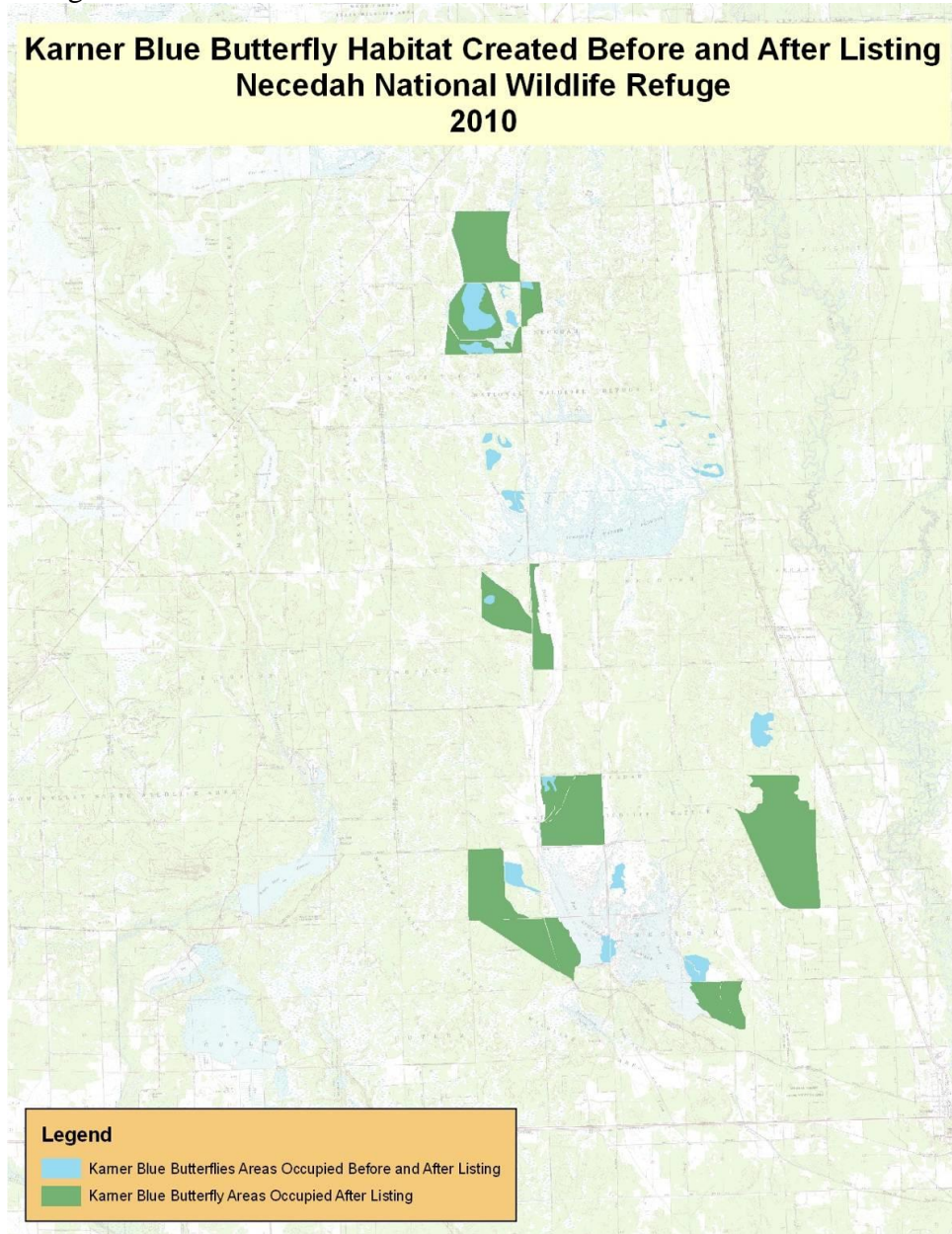


Figure 2. Units Treated in 2011. Illustration of treated units (full or partial) with Karner blue butterflies on Necedah National Wildlife Refuge.



Figure 3. Karner blue butterfly population estimate for Necedah National Wildlife Refuge. *Population estimate is obtained by applying density on surveyed units to unsurveyed units. The surveyed units represent approximately 10% of the Refuge's occupied habitat.

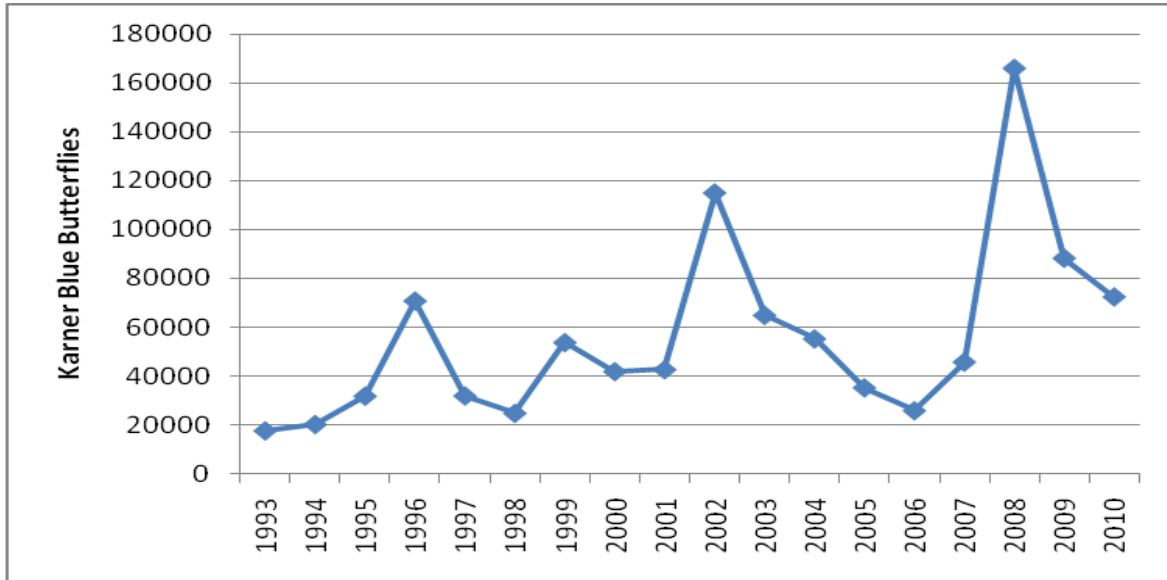


Table 1. 2011 Karner Blue Butterfly Survey Results For Necedah National Wildlife Refuge			
Burn Unit Name	Complex Name	Complex Size (acres)	KBB Counted
Prairie Restoration Unit #29A	South Ryneearson A	7.24	16
	South Ryneearson B	8.17	10
Prairie Restoration Unit #28B	South Ryneearson C	12.13	41
Prairie Restoration Unit #27	Cranberry Loop	86.14	N/A
Barrens Restoration Unit #30	Barrens Restoration Unit #30	76.90	N/A
Prairie Restoration Unit #29	North Ryneearson	22.39	20
Oak Savanna Unit #33	East Ryneearson A	60.37	16
	East Ryneearson B	7.98	29
Prairie Restoration Unit #32	East Ryneearson C	26.86	24
Barrens Restoration Unit #5	Barrens Restoration Unit #5	113.34	N/A
Barrens Restoration Unit #6	Barrens Restoration Unit #6	80.97	N/A
Barrens Restoration Unit #27	Barrens Restoration Unit #27	160.96	N/A
Prairie Restoration Unit #23	Prairie Restoration Unit #23A	17.94	N/A
Not in Burn Unit	East Sprague A	0.82	N/A
Prairie Restoration Unit #19	East Sprague B	3.39	4
	East Sprague C North	5.07	31
	East Sprague C South	4.87	9
Prairie Restoration Unit #20	East Sprague D East	2.57	4
	East Sprague D West	4.32	1
	East Sprague F	19.72	5
Prairie Restoration Unit #18	East Sprague E	14.73	14
Prairie Restoration Unit #3	Prairie Restoration Unit #3	31.78	N/A
Prairie Restoration Unit #14	Goose Pool A	10.40	11
Prairie Restoration Unit #13	Goose Pool B	38.72	11
Barrens Restoration Unit #10	Old Barrens	13.79	N/A
Prairie Restoration Unit #21A	Prairie Restoration Unit #21A	2.42	N/A
Prairie Restoration Unit #4	Prairie Restoration Unit #4	7.71	N/A
Prairie Restoration Unit #1	Prairie Restoration Unit #1	121.89	N/A
Barrens Restoration Unit #22	Barrens Restoration Unit #22	12.26	N/A
Barrens Restoration Unit #15	Barrens Restoration Unit #15	4.77	N/A
Prairie Restoration Unit #2	Prairie Restoration Unit #2 Big	36.96	N/A
	Prairie Restoration Unit #2 Little	22.02	N/A
Barrens Restoration Unit #28	Barrens Restoration Unit #28	206.38	N/A
Suk Cerney	Meadow Valley #1		N/A
	Meadow Valley #2		N/A
N/A = No counts in 2011			

Table 2. Karner blue butterfly complex size, lupine acres, and burn history at Necedah National Wildlife Refuge. *This table is the same as Appendix B in Necedah National Wildlife Refuge's Biological Opinion dated May 4, 2001.

Complex	Size (acres)	Wild lupine (acres)	Burn Unit(s) within Complex	Years Unit was Prescribe Burned
South Rynearson	19.5	0.2	PR-29A	1961;63;64;67;69;71;73;78;81;88;94
			PR-28B	1970;75;80;83;87;91
North Rynearson	14.3	0.2	PR-29	1961;63;64;67;69;71;73;78;83;88;92;99;2002; 04;08
Old Barrens	15.3	0.2	BRU10	This unit was last burned by wildfire in 1954
Goose Pool	27.4	0.3	PR-14	1973;74;75;79;85;87;92;98;2011
			PR-13	1973;75;79;85;87;91;97;98;99;2003; 06
East Sprague	27.9	0.3	PR-18	1967;72;75;79;82;87;94;98;2001; 06;08
			PR-19	1970;73;75;80;87;2003; 07;08; 10;2011
			PR-20	1969;72;75;80;87;94;2003; 07; 10; 2011
East Rynearson		1.6	<i>BRU-5</i>	1998;99;2001;03; 05; 07; 10
			<i>BRU-6</i>	1998;99;2001;03; 05; 07; 10
			OS-33	1966;69;72;80;86;89;94;98;99;2001; 04; 09
			PR-32	1972;73;75;77;81;85;86;89;98;99;2001
West Rynearson	208.6	3.3	PR-27	1970;75;78;82;87;91;93;95;97;99;2002;03;07; 09; 2011
			<i>BRU-30</i>	2001;02;03; 05; 06;08; 10
			<i>BRU-28</i>	2003; 05; 07; 09
			<i>BRU-27</i>	2003; 05; 07
Research Natural Area	13.6	0.2	BRU-22	1966;68;74; 09
Clauson Burn	5.3	0.1	BRU-15	This unit was last burned by a wildfire in 1963
Pool 19	35.8	0.4	PR-3	1973;76;87;93;2002; 07;2011
			PR-2	1974;93;2002
			PR-1	1974;93;2002; 07
			PR-4	1974;92;96;2004; 06; 10
Middle Refuge	8.3	0.5	PR-23	1973;74;78;93;96;2001;02;03; 05;08; 09; 10
			PR-21A	1973;75;77;78;82;96;

**Italics* indicates newer savannas that are not fully restored.

Table 3. Burn history and Karner blue butterfly population levels on Necedah National Wildlife Refuge. *This table is the same as Appendix C in Necedah National Wildlife Refuge's Biological Opinion dated May 4, 2001.

*East Rynearson Complex included East Rynearson Units A,B, & C as well as Barrens Restoration Units 5 & 6, which are newer units.

+West Rynearson Complex includes Cranberry Loop and Barrens Restoration Units 27, 28, & 30, which are all newer units.

#Pool #19 Complex includes Prairie Restoration Units 1, 2, 3, & 4 as well as Barrens Restoration Unit 15 (Clauson Burn).

N/A = Data were not collected.

Bolded and **highlighted** items indicate year all or portion of complex was prescribe burned. See Table 2 for burn information specific to prescribe burn units

Table 4. Prescribe burn dates and management history for eight savanna restoration units where restoration activities were initiated after federal listing of the Karner blue butterfly.

Year	OSR 5	OSR 6	OSR 30	OSR 27	OSR 28	OSR 22	OSR 15	OSR 9
1995	Uncut	Uncut	Uncut	Uncut	Uncut	Uncut	Uncut	Uncut
1996	Timber Harvest	Timber Harvest	Uncut	Uncut	Uncut	Uncut	Uncut	Uncut
1997	Timber Harvest	Timber Harvest	Uncut	Uncut	Uncut	Uncut	Uncut	Uncut
1998	April	April	Uncut	Uncut	Uncut	Uncut	Uncut	Uncut
1999	May	March	Timber Harvest	Timber Harvest	Uncut	Uncut	Uncut	Uncut
2000	Untreated	Untreated	Untreated	Untreated	Uncut	Uncut	Uncut	Uncut
2001	April	April	April	Untreated	Uncut	Uncut	Uncut	Uncut
2002	Untreated	Untreated	May	Untreated	Timber Harvest	Uncut	Uncut	Uncut
2003	April	June	April	May	June	Uncut	Uncut	Timber Harvest
2004	Untreated	Untreated	Untreated	Untreated	Untreated	Uncut	Uncut	Timber Harvest
2005	May	May	May	November	November	Uncut	Timber Harvest	April
2006	Untreated	Untreated	October	Untreated	Untreated	Timber Harvest	Timber Harvest	Untreated
2007	April	April	Untreated	May	May	Timber Harvest	Timber Harvest	April
2008	Untreated	Untreated	April	Untreated	Untreated	Timber Harvest	Timber Harvest	Untreated
2009	Untreated	Untreated	Untreated	Untreated	May	May	Untreated	Untreated
2010	March Herbicide	May Herbicide	May Herbicide	Herbicide Mowing	Herbicide	Untreated	Untreated	May/June Herbicide
2011	Herbicide	Herbicide	Herbicide	Burn (May)/ Mowing	Burn (May)	Burn (June)/ Mowing	Untreated	Herbicide

Figure 4. Estimation of population of Karner blue butterflies in survey plots at Necedah National Wildlife Refuge from 1993-2011

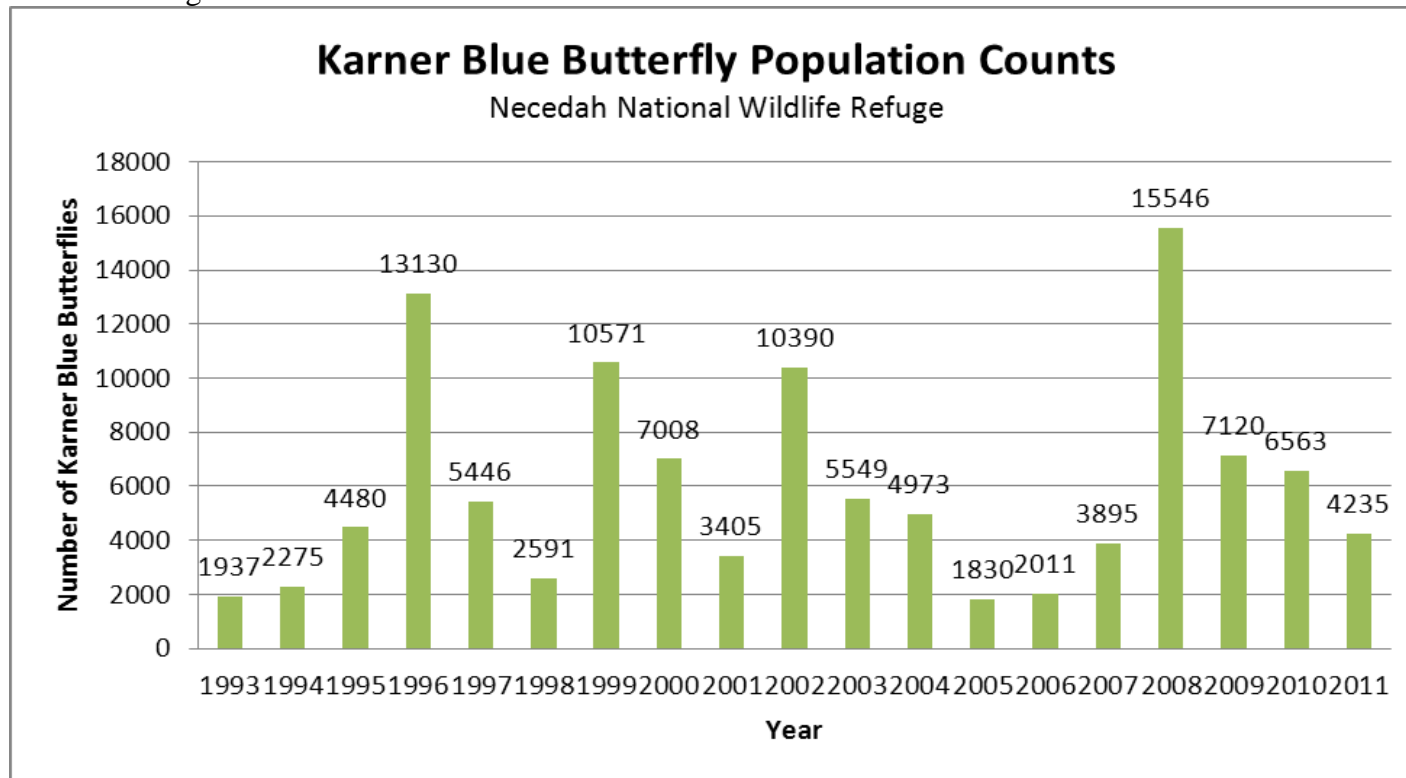


Figure 5. Estimation of the density of Karner blue butterfly population per acre of land on Necedah National Wildlife Refuge

